

Work Order ID 70521

Friday, June 10, 2011 2:52:37 PM



Page 1

Item ID: D205-596-105

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Fwd Extended

Start Date: 6/10/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 6/15/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

[Signature]

Date:

4-06-13

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
D205-596	Rev B

100

 DC
 Document Control

DOCUMENT CONTROL
 Memo
 Photocopy D205-594 bluefile & type labels per PPP D205-596-105 CHG002

0.00
 0.00

DAS 16 9-83
13/6/05
[Signature] *13-2-4*

110

 CNC Bend 2
 CNC Alpha 160 Bender

BENDING MACHINE - CROSSTUBES
 Memo
 Bend as per Dwg D2889 using CNC bender program

0.00
 0.00

TJ
MO
13-05-23

130

 QC
 Quality Control

QC15- Crosstube Dimensional Check
 Memo

0.00
 0.00

DAS 16 9-83
13/05/23

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 70521

Friday, June 10, 2011 2:52:37 PM



Page 2

Item ID:	D205-596-105	Accept		Setup	Start	
Revision ID:					Stop	
Item Name:	Crosstube Fwd Extended					
Start Date:	6/10/2011	Start Qty:	1.00		Cust Item ID:	
Required Date:	6/15/2011	Req'd Qty:	1.00		Customer:	
Reference:						

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	
	QC:	Date:	SPC (Y/N):	Date:		Stop	

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
140 	Crosstubes	0.00							
Crosstubes	Memo	0.00							
Crosstubes	1-Cut as per Dwg D205-596-105 2-Deburr & Inspect for surface damage. Polish cut surface. Scribe part # and batch # on one end of tube.								
150 	QC - Inspect dimensions to drawing	0.00							
QC	Memo	0.00							
Quality Control									
160 	Crosstubes Chemical Conversion	0.00							
HandFXtube	Memo	0.00							
Hand Finishing Crosstubes									

TW 13-05-27

TW 13-05-31

DAS

16

9-89

13/6/11

h2 36.680

Run from 13-06-11

165 → QCT → DAS 16 9-89 13/6/14

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 70521

Friday, June 10, 2011 2:52:37 PM

Page 4

Item ID: D205-596-105

Accept

Revision ID:

Item Name: Crosstube Fwd Extended

Start Date: 6/10/2011 Start Qty: 1.00

Required Date: 6/15/2011 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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200	QC5- Inspect part completeness to step on W/O	0.00							
-----	---	------	--	--	--	--	--	--	--

QC	Memo	0.00							
----	------	------	--	--	--	--	--	--	--

Quality Control

① 8 13-07-04

210	Packaging	0.00							
-----	-----------	------	--	--	--	--	--	--	--

Packaging	Memo	0.00							
-----------	------	------	--	--	--	--	--	--	--

Identify and pack for shipping as per PPP D205-596-105
Location: _____
PPP Rev: _____

220	QC21- Final Inspection - Work Order Release	0.00							
-----	---	------	--	--	--	--	--	--	--

QC	Memo	0.00							
----	------	------	--	--	--	--	--	--	--

Quality Control

1 8 13-7-5

13/7/5
mf
13-7-5

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR: Yes No** **DQA:** _____ **Date:** _____
Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Friday, June 10, 2011 2:52:43 PM







Parent Item: D205-596-105

Parent Item Name: Crosstube Fwd Extended**Start Date:** 6/10/2011**Required Date:** 6/15/2011

Start Qty: 1.00.

Required Qty: 1.00

Comments: IPP Rev:D 05.03.21 Added bending procedure KJ/JLM
 IPP Rev:E 08-01-10 ECN 1075 DD
 IPP Rev F 08.04.28 Added bending & mat'l EC verified by: DD
 IPP rev G 10.05.27 chg QC15 to QC6 EC verified by: DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6005-180  Crosstube Material		Manufactured	No	B69797		110	Each	8.0000	 1	1		TW 13-05-23	
				<u>Location</u>				<u>Loc Qty</u>		<u>Loc Code</u>			
				LG				8					
				39734				1					
				59307				7					
D2893-1  2.75 Support		Manufactured	No			190	Each	21.0000	 2	2		M 13-07-03	
				<u>Location</u>				<u>Loc Qty</u>		<u>Loc Code</u>			
				LG				15		102410			
				69713				15					
				LG052				6					
				68799				1					
				69713				5					
MS21920-25  Clamp(per MIL-DTL-8783C)		Purchased	No			190	Each	52.0000	 4	4		M 13-07-03	
				<u>Location</u>				<u>Loc Qty</u>		<u>Loc Code</u>			
				LG050				52		126162			
				116264				2					
				117998				50					

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

Friday, June 10, 2011 2:52:43 PM

Work Order ID: 70521

Parent Item: D205-596-105

Parent Item Name: Crosstube Fwd Extended

Start Date: 6/10/2011

Required Date: 6/15/2011

Start Qty: 1.00

Required Qty: 1.00

D3595-063-450

Manufactured

No

190

Each

97.0000

4

4



13.07.03

RUBBER CUSHION

Location

Loc Qty

Loc Code

LG

97

67353

3

68893

34

70113

60

101693

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

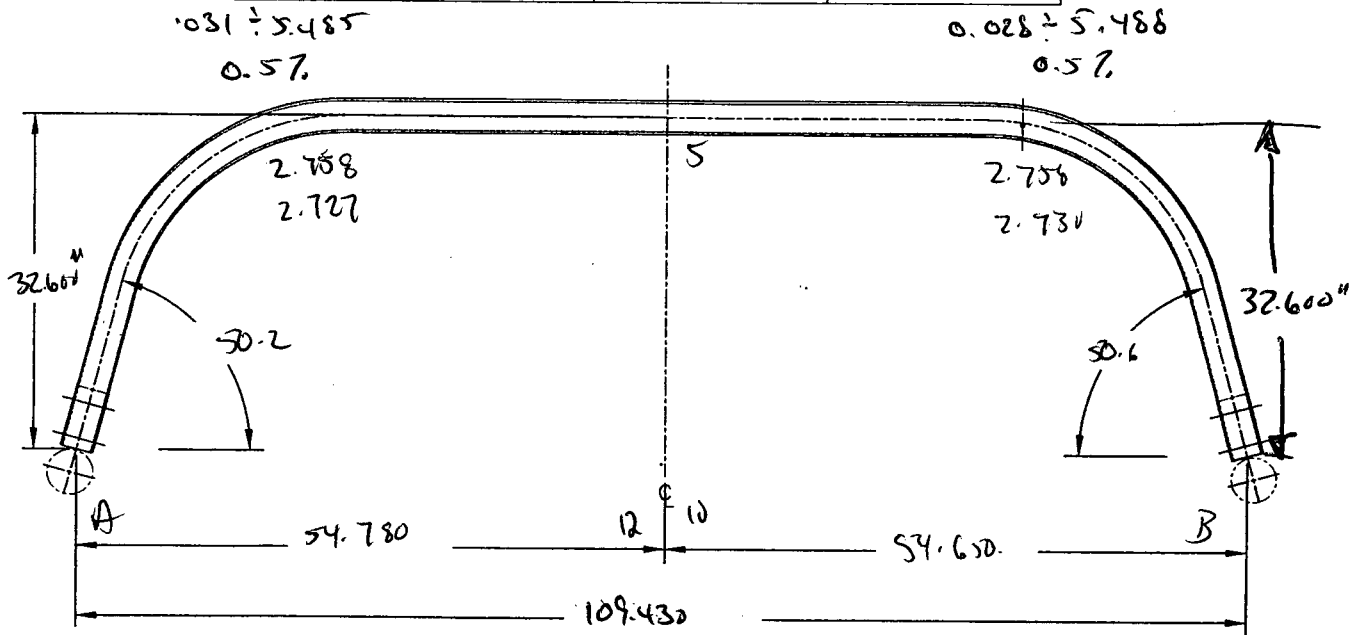
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order:	70571
Description: Crosstube High-High Fwd		Part Number:	D205-596-105
Inspection Dwg: D205-596-105 Rev: B		Page 1 of 1	

Required Dimension	Min	Max
Height	32.4	32.6
1/2 Span	54.6	54.8
Angle	49	52
Total Span	109.2	109.6



Comments
SIDE A = 0.57 cranks @ 12 Passes.
MIDDLE = 5 Passes.
SIDE B = 0.57 cranks @ 10 Passes.

QC15 Inspection	DAS
Date	16 / 13/05/23

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	08.04.21	Dwg Rev updated	KJ/JM	

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

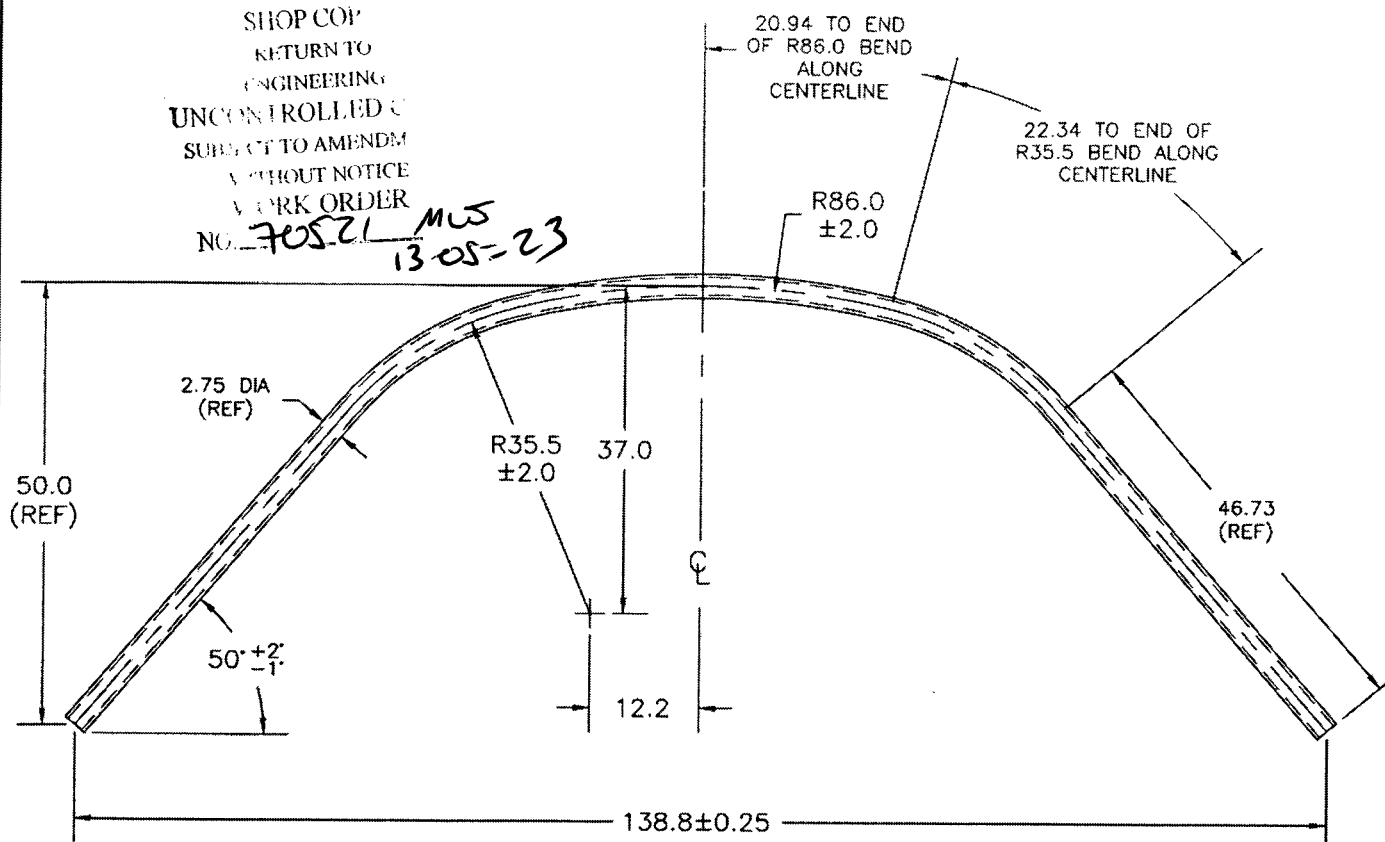
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



02.10.28
RELEASED

DESIGN	DRAWN BY	DART AEROSPACE LTD
#	#	HAWKESBURY, ONTARIO, CANADA
CHECKED	APPROVED	DRAWING NO.
#	#	D2889
DATE		TITLE
02.10.18		FWD CROSSTUBE
A	99.05.21	NEW ISSUE
B	02.10.18	ADD TANGENT LENGTHS; CHANGE NOTES
		REV. B
		SHEET 1 OF 1
		SCALE
		1:20



NOTES

- 1) MATERIAL: MANUFACTURE FROM D6005-180 (ø2.75 OD x 0.375 WALL)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
- 3) PART IS SYMMETRIC ABOUT CENTERLINE
- 4) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 5) BEND PROGRESSIVELY WITH MINIMUM OF 3 PASSES
- 6) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

PARTS LIST:

Qty	Part Number	Description
X	D205-596-105	CROSSTUBE ASSEMBLY, HI-HI FWD
1	D6005-180	CROSSTUBE
2	D2893-1	SUPPORT
4	D3595-063-450	RUBBER CUSHION
4	MS21920-25	CLAMP
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

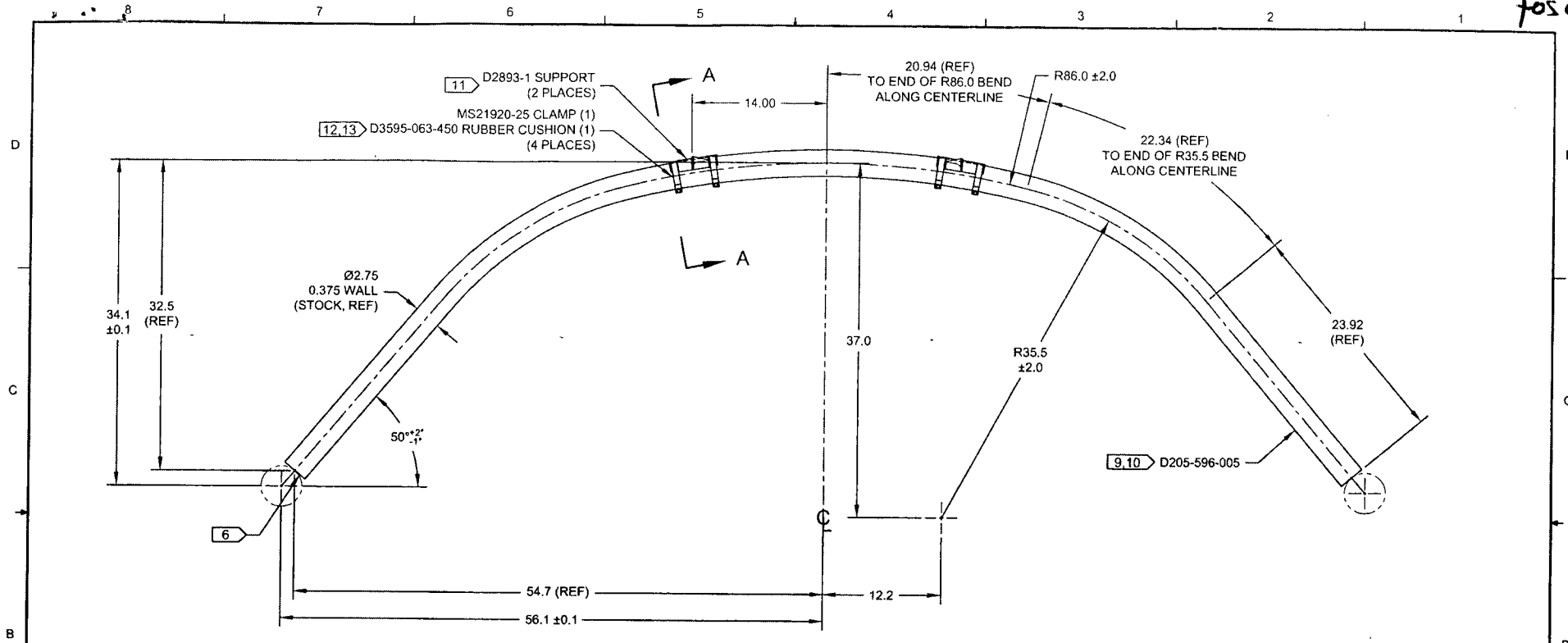
- 1) MATERIAL: MANUFACTURE FROM D6005-180
FINISHED LENGTH = 134.40 ± 0.02
 - 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART 005 4.2
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: N/A
 - 6) IDENTIFICATION: SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS
 - 7) WEIGHT: 40 lbs
 - 8) PART IS SYMMETRIC ABOUT CENTERLINE
 - 9) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
 - 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
 - 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
 - 12) INSTALL MS21920-25 CLAMPS WITH D3595-063-450 RUBBER CUSHIONS TO SECURE D2893-1 SUPPORT ON THE TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
- NOTE:** IT IS ACCEPTABLE TO SUBSTITUTE MS21920-25 CLAMPS WITH LONGER (MS21920-26) OR SHORTER (MS21920-24) CLAMPS TO ACCOMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED
SUBJECT TO APPROVAL
WITHOUT NOTICE
WORK ORDER NO.
40521
10-05-23
MCS

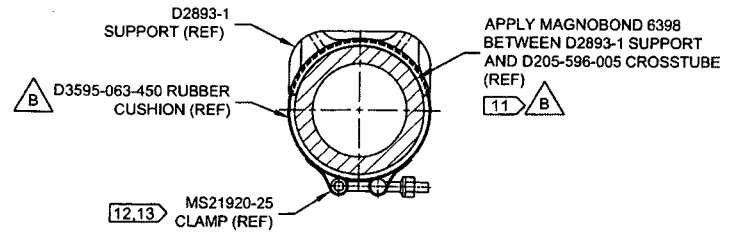
DEO ATTACHED**RELEASED**

B	SUPPORT NOW MAGNOBONDED; REMOVE D2856-600-851 ABRASION STRIP; UPDATED NOTES; ADDED D3595-063-450 CUSHION; MS21920-25 WAS MS21920-24	MB	07.12.03
A	NEW ISSUE	DS	02.11.20
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>4</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	<i>4</i>		
CHECKED	<i>PH</i>	DRAWING NO.	REV. B
MFG. APPR.	<i>PH</i>	D205-596-105	SHEET 1 OF 2
APPROVED	<i>PH</i>	TITLE	SCALE
DE APPR.	<i>PH</i>	CROSSTUBE ASSEMBLY, HI-HI FWD	NTS
DATE	07.12.03	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

70521



D205-596-105 CROSSTUBE ASSEMBLY, HI-HI FWD



SECTION A-A
SCALE 2:5

DEO ATTACHED

RELEASED
07.12.03

DESIGN		DART AEROSPACE LTD
DRAWN		HAWKESBURY, ONTARIO, CANADA
CHECKED		DRAWING NO. REV. B
MFG. APPR.		D205-596-105 SHEET 2 OF 2
APPROVED		TITLE SCALE
DE APPR.		CROSSTUBE ASSEMBLY, HI-HI FWD 1:10
DATE	07.12.03	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

70521

DRAWING NO. D205-596-105		TITLE CROSSTUBE		REV. B	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D205-596-105-B-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>CP</i>		CHECKED <i>PH</i>		MFG. APPR. <i>AA</i>		APPROVED <i>AD</i>		DE APPR. <i>HH</i>	
DATE 09.05.01		DATE 09.06.15		DATE 09/06/22		DATE 09/06/22		DATE 09.06.22	

CHANGE:

ADD THE FOLLOWING CROSSTUBE ASSEMBLY:

Part Number	Description
D205-596-105B	CROSSTUBE ASSEMBLY (214 HI-HI FWD)

THE D205-596-105B CROSSTUBE HAS THE SAME PARTS LIST AS THE D205-596-105 CROSSTUBE. HOWEVER, INSTALL THE SUPPORTS AS SHOWN IN FIGURE 1 OF THIS ENGINEERING ORDER. THE NEW KIT IS OTHERWISE ASSEMBLED PER THE D205-596-105 CROSSTUBE.

RELEASED
09/06/22 *AD*

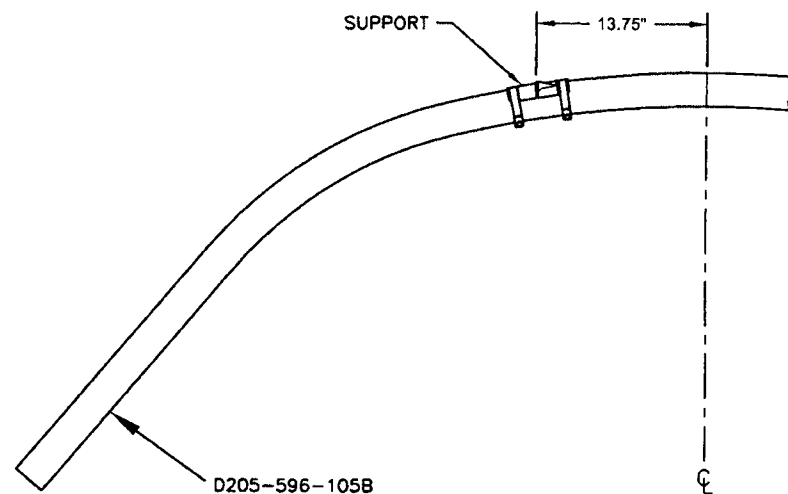


FIGURE 1 - SUPPORT INSTALLATION

